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SOLAR OBSERVATIONS.

SOLAR AND SKY RADIATION MEASUREMENTS DURING JUNE, 1921.

By IRVING F. HAND, Temporarily in Charge.

[Solar Radiation Investigations Section, Washington, D. C., July 28, 1921.]

For a description of instruments and exposures, and an account of the methods of obtaining and reducing the measurements, the reader is referred to this REVIEW for April, 1920, 48:225.

From Table 1 it is seen that the solar radiation intensities averaged slightly above normal at all the stations, but most noticeably at Santa Fe.

TABLE 1.—*Solar radiation intensities during June, 1921.*

[Gram-calories per minute per square centimeter of normal surface.]

Date.	Sun's zenith distance.										
	8a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon.
	75th meridian time.	Air mass.									Local mean solar time.
		A. M.					P. M.				
	e.	5.0	4.0	3.0	2.0	*1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
Washington, D. C.											
June 1	11.38			0.77	0.96	1.17					10.59
2	10.59					1.20					8.18
3	10.59				0.77	1.24	0.93	0.67	0.49		10.97
6	9.14		0.76	0.91	1.13	1.40					7.29
13	13.61						0.95				12.24
14	9.14						1.03				7.87
20	12.68		0.71	0.86	1.04	1.26					9.83
21	9.47				0.92	1.26					12.68
22	13.61				1.05						16.20
27	19.89		0.49	0.62	0.84	1.11					19.23
28	18.60		0.69	0.78	1.03	1.28					16.79
Means			0.66	0.79	0.97	1.24					
Departures			±0.00	+0.02	+0.06	−0.01					
Madison, Wis.											
June 4	6.02					1.44	1.19				6.02
11	17.96				1.10	1.35	1.03				9.83
17	18.59					1.16					17.96
28	15.62					1.25					16.18
Means					(1.10)	1.30	(1.14)				
Departures					−0.03	+0.00	+0.06				
Lincoln, Nebr.											
June 11	16.79			0.98	1.14	1.40	1.15	0.97	0.85		15.65
12	17.37		0.76	0.87							20.57
16	17.37			0.97	1.15	1.37					17.96
18	17.37			0.97	1.15	1.35		0.97	0.86		19.43
28	17.37			0.90	1.02	1.27					15.65
30	18.62			0.97	1.13	1.33					16.20
Means			(0.76)	0.93	1.12	1.34	(1.15)	(0.97)	(0.86)		
Departures			±0.00	+0.01	+0.03	−0.02	−0.05	+0.05	+0.08		
Santa Fe, N. Mex.											
June 8	7.29			1.15	1.24						7.87
10	5.79		0.93	1.11							8.18
11	6.27		1.06	1.18	1.33						9.83
16	8.18			1.25	1.38	1.56					6.76
17	6.50		1.14	1.22	1.36	1.47					7.57
21	5.79					1.54					9.14
22	6.50			1.17		1.55	1.34	1.13			8.48
23	5.56					1.55					7.57
24	7.04		1.06	1.20	1.35	1.52					5.79
25	7.57		0.99	1.13	1.26	1.49					7.87
29	7.29		1.06	1.12	1.19						10.59
Means			1.04	1.17	1.30	1.53	(1.34)	(1.13)			
Departures			+0.08	+0.09	+0.06	+0.06	+0.02	−0.03			

*Extrapolated.

Table 2 shows an excess in the amount of radiation received from the sun and sky at Washington during the second and third weeks, and a slight deficiency at the beginning and ending of the month. At Madison there was an excess during the first three weeks, and a deficiency during the last week. The deficiencies during the last week at both stations may be attributed, partly at least, to the period of haze which began during the latter part of June and which was very marked during the first week in July at Washington.

Skylight polarization measurements obtained at Washington on six days averaged 55 per cent with a maximum of 59 per cent on the third. Measurements obtained at Madison on three days averaged 65 per cent with a maximum of 67 per cent on the fourth. These are about average values for the respective stations for June.

TABLE 2.—*Solar and sky radiation received on a horizontal surface.*

Week beginning—	Average daily radiation.			Average daily departure for the week.			Excess or deficiency since first of year.		
	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.	Washington.	Madison.	Lincoln.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
June 4	493	522	.....	− 10	−19	.....	−869	−5030	.....
11	617	541	.....	+ 98	+22	.....	−185	−4874	.....
18	636	598	.....	+108	+64	.....	+572	−4424	.....
25	482	511	.....	− 44	−30	.....	+263	−4634	.....

MEASUREMENTS OF THE SOLAR CONSTANT OF RADIATION AT CALAMA, CHILE, MAY, 1921.

By C. G. ABBOT, Assistant Secretary.

[Smithsonian Institution, Washington, Aug. 1, 1921.]

In continuation of preceding publications, I give in the following table the results obtained at Montezuma, near Calama, Chile, in May, 1921, for the solar constant of radiation. The reader is refered to this REVIEW for February, August, and September, 1919, for statements of the arrangement and meaning of the table.

Date.	Solar constant.	Method.	Grade.	Transmission coefficient at 0.5 micron.	Humidity.			Remarks.
					P/ρ s. c.	V. P.	Rel. Hum.	
1921.								
P. M.	*cal.*					*c. m.*	*Per cent.*	
May 3	1.933	$M_{1.63}$...	S−	0.867	0.581	0.38	16	Cumuli over high peak.
	1.957	$M_{1.45}$...						
	1.946	W. M..						
A. M.								
4	1.952	$M_{1.35}$...	S	.879	.664	.25	12	Cirri in east earlier in morning.
	1.948	$M_{1.31}$...						
	1.950	W. M..						
P. M.								
5	1.933	$M_{2.61}$...	S−	.875	.459	.40	21	
6	1.952	$M_{1.66}$...	S	.875	.558	.51	28	Small patches of clouds over high peaks.
	1.949	$M_{1.63}$...						
	1.950	W. M..						
8	1.952	$M_{1.68}$...	S	.879	.630	.33	12	
	1.958	$M_{1.65}$...						
	1.955	W. M..						
9	1.938	$M_{1.76}$...	S	.879	.634	.35	16	
	1.949	$M_{1.64}$...						
	1.944	W. M..						
A. M.								
14	1.938	$M_{1.94}$...	S	.883	.682	.26	14	
	1.944	$M_{1.82}$...						
	1.941	W. M..						
15	1.934	$M_{1.73}$...	S	.883	.696	.21	9	
	1.941	$M_{1.63}$...						
	1.937	W. M..						
P. M.								
21	1.863	$M_{2.30}$...	U+	.881	.613	.28	13	Cirri in various parts of sky.
	1.871	$M_{2.64}$...						
	1.868	W. M..						
22	1.937	$M_{1.92}$...	S	.875	.626	.19	8	Cirro-cumuli all around east.
	1.936	$M_{1.70}$...						
	1.937	W. M..						
A. M.								
23	1.933	$M_{1.66}$...	S	.880	.701	.22	9	
	1.936	$M_{1.65}$...						
	1.935	W. M..						
P. M.								
24	1.963	$M_{1.64}$...	S−	.881	.748	.20	6	
	1.958	$M_{1.62}$...						
	1.960	W. M..						
A. M.								
25	1.955	$M_{1.39}$...	S	.885	.820	.13	4	
	1.946	$M_{1.38}$...						
	1.950	W. M..						
28	1.941	$M_{1.41}$...	S−	.871	.688	.18	8	Cirro-cumuli scattered about sky.